

**Notice of Allowability**

Application No.

10/707,045

Examiner

JOHN F. RAMIREZ

Applicant(s)

WEYERS ET AL.

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 07/01/09 and 10/29/09.
2. ☒ The allowed claim(s) is/are 1-6,9-15,18-24 and 26.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

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| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Notice of Informal Patent Application  |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date <u>20091103</u> . |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br>Paper No./Mail Date _____    | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment  |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance                         |
|  | 9. <input type="checkbox"/> Other _____.   |

## DETAILED ACTION

### EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Thomas Donohue on October 29, 2009.

The application has been amended as follows:

#### IN THE CLAIMS:

Claim 1. A drivable imaging coil comprising:

a pair of end rings substantially centered around a common axis and spaced apart along the length of said axis;

a pair of balun-less drive cables respectively coupled to said end rings;

a central ring substantially centered around said axis so as to be parallel to and situated between said end rings; ~~and~~

a plurality of legs coupled between said pair of end rings and said central ring;  
and

a plurality of capacitor groupings coupled along said pair of end rings, wherein each of said capacitor groupings includes a plurality of capacitors with a group coverage area having a width that is greater than 5.0cm;

wherein each of said end rings has a radius that is greater than the radius of said central ring, and said central ring is grounded and has a low impedance such that said central ring is effectively shorted to ground when coupled to ground during operation of said imaging coil.

Claim 7. Cancelled.

Claim 8. Cancelled.

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Claim 10. A drivable imaging coil comprising:

a pair of end rings substantially centered around a common axis and spaced apart along the length of said axis;

a pair of balun-less drive cables respectively coupled to said end rings;

at least one central ring substantially centered around said axis so as to be parallel to and situated between said end rings, said at least one central ring including a plurality of capacitors having low impedance at frequency levels of at least 120MHz; and

a plurality of legs coupled between said pair of end rings and said at least one central ring;

wherein said plurality of legs includes (i) a first series of legs coupled between one of said end rings and said at least one central ring and (ii) a second series of legs coupled between the other one of said end rings and said at least one central ring; and

wherein each of said end rings respectively has a radius that is greater than each respective radius of said at least one central ring, and at least one said central ring is grounded-and-has a low impedance such that said central ring is effectively shorted to ground when coupled to ground during operation of said imaging coil.

Claim 12. A drivable imaging coil comprising:

a first plurality of end rings substantially centered around a common axis and situated along the length of said axis;

a second plurality of end rings substantially centered around said axis and situated along the length of said axis so as to be spaced apart from said first plurality of end rings;

a plurality of balun-less drive cables coupled to said first and second plurality of end rings;

at least one central ring substantially centered around said axis so as to be parallel to and situated between said first and second plurality of end rings, said at least one central ring includes a plurality of capacitors having low impedance at frequency levels of at least 120MHz; and

a plurality of legs coupled between said first and second plurality of end rings and said at least one central ring;

wherein each of said first and second plurality of end rings respectively has a radius that is greater than each respective radius of said at least one central ring, and at least one said central ring is structurally adapted for being coupled to a ground reference during operation of said imaging coil, said central ring having a low impedance such that said central ring is effectively shorted to a ground reference when coupled to said ground reference during operation of said imaging coil.

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and said plurality of legs are configured so as to form a birdcage-style imaging coil.

Claim 14. A drivable imaging coil comprising:

a plurality of end rings;

a plurality of balun-less drive cables coupled to said plurality of end rings;

at least one central ring situated both parallel to and between said plurality of end rings with at least one said central ring being grounded and having a low impedance such that said central ring is effectively shorted to ground when coupled to ground during operation of said imaging coil and having a low impedance so that said central ring is effectively shorted, said at least one central ring includes a plurality of capacitors having low impedance at frequency levels of at least 120MHz; and

a plurality of legs coupled between said plurality of end rings and said at least one central ring.

Claim 16. Cancelled.

Claim 17. Cancelled.

Claim 19. A magnetic resonance imaging (MRI) system having a patient bore, said MRI system comprising:

a radio-frequency (RF) shield; and

a drivable imaging coil at least partially surrounded by said RF shield and including:

(i) a pair of end rings substantially centered around a common axis and spaced apart along the length of said axis;

(ii) a pair of balun-less drive cables respectively coupled to said pair of end rings;

(iii) a central ring substantially centered around said axis so as to be parallel to and situated between said pair of end rings, said central ring having a plurality of capacitors and a plurality of connections there between, said plurality of capacitors having low impedance at frequency levels of at least 120MHz; and

(iv) a plurality of legs coupled between said pair of end rings and said central ring;

wherein each of said end rings has a radius that is greater than the radius of said central ring, and said central ring is grounded and has a low impedance such that

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said central ring is effectively shorted to ground when coupled to ground during operation of said imaging coil.

Claim 25. Cancelled.

The following is an examiner's statement of reasons for allowance:

The prior art of record of Reisker, Murphy-Boesch, Srinivasan, Petropoulos and JP 07001825, either alone or in combination does not teach or suggest a drivable imaging coil with an arrangement having a grounded center ring paired by way of a plurality of legs to two greater diameter end rings on either side, in which said central ring has a low impedance such that said central ring is effectively shorted to ground when coupled to ground during operation of said imaging coil as now recited in claims 1, 10, 12, 14 and 19 including all the limitations of the base claim and any intervening claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN F. RAMIREZ whose telephone number is (571)272-8685. The examiner can normally be reached on (Mon-Fri) 7:00 - 3:30 p.m.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian L. Casler can be reached on (571) 272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BRIAN CASLER/  
Supervisory Patent Examiner, Art  
Unit 3737

/J. F. R./  
Examiner, Art Unit 3737